

CONTRIBUTIONS TOWARD A MONOGRAPH OF THE MUTILLIDAE AND THEIR ALLIES OF AMERICA NORTH OF MEXICO

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III. THE MUTILLIDAE OF THE EASTERN UNITED STATES

A KEY TO THE GENERA AND SUBGENERA OF MUTILLIDAE KNOWN TO OCCUR IN THE EASTERN UNITED STATES

Males

1. Eyes deeply emarginate (2)
Eyes not deeply emarginate (3)
2. Petiole short, transverse, nearly cylindrical, not at all sessile with the second;
third to seventh dorsal segments with a median longitudinal keel.

Ephuta Say

Petiole enlarged at apex and sessile with the second segment, or nearly so;
dorsal segments without or only the last one with a median keel.

Mutilla Linnaeus, subgenus **Timulla** Ashmead

3. Head transversely quadrate, the postero-lateral angles carinate; petiole
enlarged posteriorly and sessile with the second segment. Color entirely
black. **Pseudomethoca** Ashmead, subgenus **Pseudomethoca** Ashmead
Head sometimes very long behind the eyes, but with the postero-lateral
angles always rounded, never carinate (4)
4. Mandibles robust and of peculiar shape, forming with the concave clypeus
and labrum a basin,¹ usually they are truncate and tridentate, sometimes
deflexed at apex and often with a deep notch on the inferior margin . . (5)
Mandibles slender and of normal shape, never with an external notch . . (7)
5. Ocelli very small, the posterior removed from the anterior by more than the
length of their longer diameter, and from the compound eyes by many
times the same (diurnal species) (6)
Ocelli large, the posterior removed from the anterior by not more than the
length of their longer diameter, and from the compound eyes by two or
three times the same (nocturnal species); mesosternum armed with a
ridge or process. **Photopsis** Blake, subgenus **Odontophotopsis** Viereck
6. Mesosternum simple, unarmed.

Sphaerophthalma Blake, subgenus **Sphaerophthalma** Blake

Mesosternum armed with a pair of tubercles, carinae or peg-like processes.

Sphaerophthalma Blake, subgenus **Photomorphus** Viereck

¹There are many species in the western United States to which this characterization is not applicable.

7. Petiole not nodose, much widened toward the apex and sessile with the second segment, which is but little wider than the apex of the petiole; second ventral segment never carinate.

Pseudomethoca Ashmead, subgenus **Nomiaephagus** Ashmead
Petiole only slightly enlarged at apex, constricted before the base of the second segment and often strongly nodose, the second segment much wider than the apex of the petiole. If the latter is sessile, the second ventral segment is carinate. (8)

8. Second ventral segment with a longitudinal keel surmounted by a crest of bristles. **Dasymutilla** Ashmead, subgenus **Bruesia** Ashmead
Second ventral segment without a keel, but often with a pit filled with bristles. **Dasymutilla** Ashmead, subgenus **Dasymutilla** Ashmead

Females

1. Petiole evenly and greatly enlarged toward the apex,² not at all constricted but perfectly sessile with the second segment, which is not or but little wider than its apex; front usually with a carina between the eyes and the bases of the antennae (2)

Petiole constricted at its apex, which is not greatly, sometimes not at all larger than the base; the second segment greatly wider than the first; face rarely with a carina between the eyes and the bases of the antennae; if so the postero-lateral angles of the head are carinate, or the insects are large, densely yellow or scarlet and black tomentose. (5)

2. Inferior angles of the temples with a sharp spine; postero-lateral angles of head carinate; head very large, decidedly wider than the thorax; antennae remote from one another at base; pygidium not defined.

Pseudomethoca Ashmead, subgenus **Pseudomethoca** Ashmead
Temples without a spine, sometimes with a posterior carina; postero-lateral angles of head unarmed. (3)

3. Eyes small and round, their width over .85 of their length. (4)
Eyes elongate, triangularly oval, their width under .7 of their length; the margin of the clypeus with a strongly arched median elevation, margined anteriorly and with median and two lateral teeth; front with a carina between the antennae and the eyes; mandibles without a third tooth within. **Mutilla** Linnaeus, subgenus **Timulla** Ashmead

4. Front with a carina between the eyes and the antennae; the clypeus with a transverse depressed basin above its margin, or its surface flat and smooth; mandibles with a third tooth within.

Pseudomethoca Ashmead, subgenus **Nomiaephagus** Ashmead
Front devoid of carinae; mandibles without a third tooth within.

Photopsis Blake

5. A distinctly defined pygidial area present, either striate, granulate, or rugose (7)
No definite pygidial area present. (6)

² This character does not apply to certain species of *Photopsis* from the western United States.

6. First abdominal segment almost sessile with the second, distinctly widened toward the apex, and fully as long as wide at the apex, without pubescence except for a median apical tuft; antennae not quite touching one another at base.....**Sphaerophthalma** Blake
First segment of the abdomen much smaller than the second, petioliform, not widened toward the apex, transversely quadrate, entirely white pubescent; antennae touching one another at base.....**Ephuta** Say
7. Pygidium granulate or longitudinally striate, except sometimes at apex; mandibles without a third tooth within.

Dasymutilla Ashmead, subgenus **Dasymutilla** Ashmead

Pygidium rugulose; mandibles tridentate (often worn away).

Dasymutilla Ashmead, subgenus **Bruesia** Ashmead

KEYS TO THE SPECIES OF MUTILLIDAE KNOWN TO OCCUR IN THE EASTERN UNITED STATES

PSEUDOMETHOCA Ashmead

Subgenus **Pseudomethoca** Ashmead

Males and Females

Only one eastern species.

canadensis (Blake)

Subgenus **Nomiaephagus** Ashmead

Males

1. Ground color entirely coal-black, pubescence black and white or partially fiery red..... (2)
At least the second abdominal segment of an orange color; pubescence almost entirely black, with a slight admixture of yellowish..... (3)
2. Each dorsal segment with an apical band of fiery red pubescence.

vanduzeei n. sp.

Pubescence white, with a slight admixture of black, no red. **geryon** (Fox)

3. Clypeus narrowly notched at apex, with a very prominent papilliform tooth on each side..... **oceola** (Blake)
- Clypeus shallowly emarginate, with a weak angle at each side.

sanbornii (Cresson)

Females

1. Head wider than the thorax, as wide behind the eyes as its width measured from one extreme lateral extension of the eyes to the other; narrower diameter of the eyes equal to .6 of the width of the temples behind them..... (2)
Head no wider than the thorax; narrower diameter of the eyes equal to the width of the temples behind them..... (3)
2. Pygidium transversely rugulose; posterior face of the propodeum at right angles with the dorsal..... **hippodamia** (Fox)

- Pygidium longitudinally striate; posterior face of the propodeum at an obtuse angle to the dorsal. **simillima** (Smith)
3. Pygidium obliquely striated. **actis** (Fox)
- Pygidium finely rugulose. **montivaga** (Cresson)

DASYMUTILLA Ashmead

Subgenus **Bruesia** Ashmead

Males

The only eastern species of which the male is known is. . . **bexar** (Blake)

Females

The only eastern species of which the female is known is. . . **harmonia** (Fox)

Subgenus **Dasymutilla** Ashmead

Males

1. Color entirely black, with white pubescence. **gibbosa** (Say)
Color not entirely black. (2)
2. Top of head, mesonotum, and scutellum with long, dense, scarlet or yellow pubescence. (3)
Top of head, mesonotum, and scutellum with short, sparser, black pubescence. (5)
3. First and second dorsal segments with rather dense black pubescence, remaining dorsal segments with dense, scarlet or yellow, long pubescence, except sometimes for a transverse band of black pubescence, occupying the fifth and parts of the fourth and sixth segments. (4)
Abdomen dorsally with moderately dense black pubescence, except on the apical half of the second segment where it is yellowish. . . **pyrrhus** (Fox)
4. Punctuation of second dorsal segment sparse medially, so that the segment is more or less shiny in that spot, ventrally the segment has rather even strong punctures. **occidentalis** (Linnaeus)
Punctuation of the second dorsal segment even throughout, ventrally the punctures are not so strong or regular as in *occidentalis*; segment three and the following usually with fulvous pubescence. **comanche** (Blake)
5. Abdomen entirely red or yellowish, except the petiole. . . **obscura** (Blake)
Abdomen black, except for the second and sometimes the third segment. (6)
6. Pubescence of second dorsal segment black throughout. (7)
Pubescence of second dorsal segment yellow or scarlet, at least in part. (9)
7. Punctuation of first abdominal segment unusually coarse and irregular; propodeum coarsely reticulate. (8)
Punctuation of first dorsal segment and reticulation of propodeum more shallow and less coarse. (Aberrant individuals). **castor** (Blake)
8. Entire second and third abdominal segments red; legs, petiole, and venter with erect white pubescence. **obscura** (Blake)
Third abdominal segment and usually the second ventral, black; legs, petiole, and venter with erect black pubescence. **canella** (Blake)

9. Second dorsal segment with long, scarlet, sometimes yellowish, pubescence, except sometimes at base; petiole rugose, but slightly enlarged at apex, as seen from the sides neither gibbous nor strongly constricted from the second segment **macra** (Cresson)
 Second dorsal segment with short, sparse, usually orange hairs confined to the apical half, the others black (10)
10. Petiole strongly nodose, and as seen from the side constricted before the second segment, closely and coarsely punctured **castor** (Blake)
 Petiole shorter and broader, as seen from the side not nodose, scarcely constricted before the second segment, weakly and sparsely punctured. **lepeletierii** (Fox)
 Petiole short and broad, moderately nodose, very coarsely punctured. **agenor** (Fox)

*Females*³

1. Lateral angles of the head prominent and carinate or tuberculate; pygidium striate (2)
 Lateral angles of the head rounded, neither carinate nor tuberculate. (9)
2. Petiole transverse or quadrate, its posterior border almost truncate and grossly punctured, as seen from the side it is only slightly thickened posteriorly and distinctly constricted from the second; second dorsal segment medially sparsely punctate; hind angles of the head subrounded and not prominently tuberculate **rugulosa** (Fox)
 Petiole not quadrate, its posterior border strongly convex, without coarse sculpture, as seen from the side strongly elevated posteriorly and not appreciably constricted before the second segment; second dorsal uniformly closely punctured (3)
3. Front with a delicate carina on each side extending from the base of the antenna to the eye; head including the eyes, wider than the thorax, its posterior margin nearly truncate, somewhat sinuous, its occipital face with a transverse flattened tubercle at each lateral angle; the thorax narrowed posteriorly; the caudal face of the propodeum sloping. **cariniceps** (Fox)
 Front without carinae between the eyes and the antennae; head no wider, often narrower than the thorax, its posterior margin either strongly concave or nearly truncate, in which case it has an oblique tubercle at the angles; the caudal face of the propodeum almost at right angles to the dorsum (4)
4. Lateral angles of the occiput with an oblique tubercle (8)
 Lateral angles of the occiput without an oblique tubercle (5)
5. Margins of the head behind the eyes flaring outward to the very prominent angles, which are one-third farther apart than the least distance between the eyes; base of the propodeum marked by a carina and groove, sometimes more or less interrupted (6)

³ *Chlamydata* Melander, known only from Illinois, is omitted from this table as I have not seen a specimen.

- Margins of the head converging posteriorly behind the eyes, the angles not prominent, not over one-eighth farther apart than the least distance between the eyes, sometimes less than this; propodeum not separated from the thorax proper. (7)
6. Propodeum with a transverse band of dense black pubescence; color claret-brown, with a fringe of silvery pubescence at the apex of each abdominal segment. **rubicunda** n. sp.
- Propodeum without a pubescent band; color mars orange, with two large mikado orange spots on the second dorsal segment; apex of the petiole not pubescent, of the second dorsal segment black pubescent, the following three segments entirely griseous. **anguliceps** (Fox)
7. Margins of the head behind the eyes scarcely converging posteriorly, one-eighth wider than the least distance between the eyes; the posterior margin of the head shallowly convex; the extreme width of the head, including the eyes, equal to the width of the thorax **chattahoochei** n. sp.
- Margins of the head behind the eyes strongly rounded inwards to the hind angles, slightly narrower than the least distance between the eyes; posterior margin of the head deeply concave; head slightly wider than the thorax. **arenerronea** n. sp.
8. Color ferruginous (chestnut to Sanford's brown).
 cypris (Blake), variety **cypris** (Blake)
 Color rufo-piceous (between bay and black).
 cypris (Blake), variety **miamensis** (Rohwer)
9. A sharp carina on each side between the eye and the base of the antenna; large tomentose species, scarlet or yellow and black, the abdomen scarlet or yellow above, with a transverse black band beyond the middle. (10)
 Front not carinate; smaller species, never densely tomentose and not colored as above. (11)
10. Color bright scarlet (English red). **occidentalis** (Linnaeus)
 Color yellow (raw sienna). **comanche** (Blake)
11. Pygidium evenly granulated. **obscura** (Blake)
- Pygidium longitudinally striate. (12)
12. Carina on venter of petiole reduced to an acute, recurved, anterior tooth, totally wanting on the apical half of the petiole. . . **ferrugata** (Fabricius)
 Carina on venter of petiole extending its entire length, usually with both an apical and basal production, neither acute nor recurved. (13)
13. Head and thorax with conspicuous, appressed, red or yellowish pubescence; front more closely punctured than the cheeks; legs ordinarily black.
 vesta (Cresson), race **zelia** Rohwer
- Head and thorax without conspicuous, appressed pubescence; front sparsely punctured like the cheeks; legs red, rarely dark. **sappho** (Fox)

SPHAEROPHTHALMA BlakeSubgenus **Sphaerophthalma** Blake*Males*

Black with the second abdominal segment yellow, the petiole and head above sometimes slightly reddish.

pennsylvanica (Lepeletier), race **scaeva** Blake

Legs, apex of the first and second dorsal and all of the remaining abdominal segments black; otherwise dark red.

pennsylvanica (Lepeletier), race **pennsylvanica** (Lepeletier)

Females

Only the one species and race is recognized in this sex.

pennsylvanica (Lepeletier), race **pennsylvanica** (Lepeletier)

Subgenus **Photomorphus** Viereck*Males*

1. Head quadrate, the vertex behind the eyes very elongate; mesosternum with a long peg-like process in front of each coxa. Entirely black.

banksi n. sp.

Head transverse, the vertex not elongate behind the eyes; posterior part of mesosternum unarmed. (2)

2. Mesosternal processes transverse blunt tubercles. (3)
Mesosternal processes longitudinal denticulate carinae. . . **aloga** (Viereck)

3. Vertex closely punctured; front rugose; propodeum with a double median area at base; wings with a strong fuscous cloud in the region of the stigma; head, thorax, and petiole entirely red, otherwise black. **johnsoni** (Viereck)
Vertex sparsely, front obsoletely, punctured, not rugose; propodeum without a median area; entirely black, except scutellum and spot on propodeum are reddish yellow. **rubroscutellata** n. sp.

Females

The female sex of this subgenus remains unknown.

PHOTOPSIS Blake*Females*

The subgeneric position of the only species of this genus known from the Eastern States in the female sex is unknown. **myrmicoides** (Cockerell)

Subgenus **Odontophotopsis** Viereck*Males*

Petiole strongly nodose, much constricted at apex; mesosternal processes are two transverse carinae. **paula** n. sp.

Petiole but slightly nodose, not much constricted at apex, mesosternum with two blunt, somewhat transverse, finger-like processes. . . . **spinei** n. sp.

EPHUTA Say and **MUTILLA** Linnaeus, subgenus **TIMULLA** Ashmead

For keys to the species of these groups see the revisions of the North American species in the preceding pages.⁴

A LIST OF THE SPECIES OF MUTILLIDAE KNOWN TO OCCUR IN THE
EASTERN UNITED STATES, WITH INDICATION OF THEIR
PROBABLE SEXUAL EQUIVALENTS⁵

We have now sufficiently extended and thorough collections of Mutillidae from the Eastern States, with the exception of Florida, to make tentative conclusions concerning the correlation of the sexes possible. These conclusions as expressed in the following table, are derived from a careful comparison of the distribution of the several species, their relative abundance, local abundance and association, etc. They fall short of being conclusive and I have therefore not amalgamated the names of the species, but I am confident that they will eventually prove to be in the main correct.

Males	Females
Pseudomethoca Ashmead	
(Pseudomethoca) Ashmead	
<i>canadensis</i> (Blake)	<i>canadensis</i> (Blake)
(Nomiaephagus) Ashmead	
<i>geryon</i> (Fox)	? <i>simillima</i> (Smith)
<i>sanbornii</i> (Cresson)	? <i>montivaga</i> (Cresson)
?	<i>aetis</i> (Fox)
<i>oceola</i> (Blake)	<i>hippodamia</i> (Fox)
<i>vanduzeei</i> n. sp.	?
Dasymutilla Ashmead	
(Bruesia) Ashmead	
<i>bexar</i> (Blake)	<i>harmonia</i> (Fox)
(Dasymutilla) Ashmead	
<i>occidentalis</i> (Linnaeus)	<i>occidentalis</i> (Linnaeus)
<i>comanche</i> (Blake)	<i>comanche</i> (Blake)
<i>pyrrhus</i> (Fox)	?

⁴ These Transactions, xlii, pp. 192 to 193, 202 to 205.

⁵ *Psammotherma ajax* Blake, described from Florida, is supposed to be identical with *Psammotherma flabellata* Fabricius, and it is thought to have been incorrectly reported from North America.

<i>agenor</i> (Fox)	? <i>anguliceps</i> (Fox)
<i>gibbosa</i> (Say)	<i>cariniceps</i> (Fox)
?	<i>chattahoochei</i> n. sp.
?	<i>rubicunda</i> n. sp.
?	<i>arenerronea</i> n. sp.
<i>canella</i> (Blake)	<i>rugulosa</i> (Fox)
<i>castor</i> (Blake)	<i>cypriis</i> (Blake)
<i>lepeletierii</i> (Fox)	<i>ferrugata</i> (Fabricius)
<i>macra</i> (Cresson)	<i>vesta</i> (Cresson), race <i>zella</i> Rohwer
?	<i>sappho</i> (Fox)
<i>obscura</i> (Blake)	[<i>scaevola</i> (Blake)]
?	<i>chlamydata</i> (Melander)

Sphaerophthalma Blake

(Sphaerophthalma) Blake

<i>pennsylvanica</i> (Lepeletier) {	race <i>pennsylvanica</i> (Lepeletier)	{	[<i>balticola</i> Blake]
	race <i>scaeva</i> Blake		

(Photomorphus) Viereck

<i>banksi</i> n. sp.	?
<i>aloga</i> (Viereck)	?
<i>johnsoni</i> (Viereck)	?
<i>rubroscutellata</i> n. sp.	?

Photopsis Blake

?	<i>myrmicoides</i> (Cockerell)
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(Odontophotopsis) Viereck

<i>paula</i> n. sp.	?
<i>spinci</i> n. sp.	?

Mutilla Linnaeus

(Timulla) Ashmead

<i>briaxus</i> (Blake)	<i>briaxus</i> (Blake) [= <i>dubitata</i> pars]
<i>rufa</i> Lepeletier	<i>rufa</i> Lepeletier [= <i>dubitata</i> pars]
<i>hexagona</i> (Say)	<i>hexagona</i> Say [= <i>dubitata</i> pars]
<i>rufosignata</i> Bradley	?

<i>promethea</i> (Blake)	<i>promethea</i> (Blake) [= <i>dubitata</i> pars]
<i>floridensis</i> (Blake)	? <i>euterpe</i> (Blake)
<i>ornatipennis</i> Bradley	<i>ornatipennis</i> Bradley

Ephuta Say

<i>scrupea</i> Say	<i>puteola</i> (Blake) pars ?
<i>pauquilla</i> Bradley	<i>puteola</i> (Blake) pars ?
<i>battlei</i> Bradley	?
<i>slossonae</i> (Fox)	?

A REVIEW OF THE DISTRIBUTION AND SYNONYMY OF THE SPECIES OF MUTILLIDAE KNOWN TO OCCUR IN THE EASTERN UNITED STATES.

In the following review the synonymy is noted only where it differs from that given by Mr. Fox in his synopsis of the family.⁶

Pseudomethoca

Pseudomethoca (Pseudomethoca) canadensis Blake, ♂, ♀.

This is a common species of the Transition Zone. It ranges from the Canadian southward into the Carolinian and, at least sparingly, into the Austroriparian Zone. The species is known from Canada, is common in New England, New York, and the Coastal Plain south to Virginia. Farther south it seems to be very scarce. I have seen one specimen each from Georgia and Texas, and two each from North Carolina and Florida. Westward I have seen specimens from Nebraska and Missouri. The southern records are as follows:

NORTH CAROLINA: Lake Toxaway, 1 specimen, (Mrs. A. T. Slosson), [Mrs. A. T. Slosson]; Black Mountains, July, 1 ♀, (Wm. Beutenmuller), [Amer. Mus. Nat. Hist.]. GEORGIA: Spring Creek, Decatur County, 1 ♀, (the author), [Cornell Univ.]. FLORIDA: Biscayne Bay, 2 specimens, (Mrs. A. T. Slosson), [Mrs. A. T. Slosson]. TEXAS: 1 ♀, [Amer. Ent. Soc.].

Mr. Melander indicates that the species is common in Central Texas, but it certainly is not in Georgia, where I have collected Mutillidae over a considerable area.

Pseudomethoca (Nomiaephagus) geryon (Fox), ♂.

1899. *Mutilla geryon* Fox, Trans. Amer. Ent. Soc., 25: 225, ♂.

1903. *Mutilla henshawi* Melander, Trans. Amer. Ent. Soc., 29: 303, ♂.

1910. *Mutilla daeckei* Rohwer, Proc. Ent. Soc. Wash., 12: 49, ♂.

⁶ Trans. Am. Ent. Soc., 1899, 25: 219 to 292.

Various individuals of this species from Falls Church, Virginia, show cell R_4 either wholly absent, partially enclosed, or totally enclosed by traces of veins, as in *Nomiaephagus*.

I have examined the type of *henshawi* Melander in the Museum of Comparative Zoology, and find it identical with this species. The posterior ocelli are not rudimentary, as stated in the description of *henshawi*, but in the type specimen are as large as the anterior one, concealed somewhat by an elevated portion of the vertex, their plane being raised almost to the vertical. As in the type of *henshawi*, the mandibles of many specimens are so worn as not to show three teeth, while in others the two inner ones are quite distinct.

I have not seen the type of *daecke* Rohwer, but the only difference indicated in its description is in the amount of white pubescence on the abdomen. A series of specimens of *geryon* shows almost complete replacement of the white pubescence of the dorsal segments, including the apical fringes, by black, as described for *daecke*.

It is possible that *geryon* is the male of *simillima*.

MASSACHUSETTS: Forest Hills, August 31, 1898, (Mr. S. Henshaw), [Mus. Comp. Zool.], and Woods Hole, August, 1900, (A. L. Melander), types of *henshawi*. NEW YORK: Sea Cliff, Long Island, August, (N. Banks), [N. Banks]. NEW JERSEY: Lucaston, August 27, 1905, and Banber, September 1, 1905, (E. Daecke, types of *daecke*), [U. S. Nat. Mus.]. DISTRICT OF COLUMBIA: Washington, September 6, (N. Banks), [N. Banks]. VIRGINIA: Falls Church, August 20, 21, 24, 27, 31, September 2, 9, (N. Banks), [N. Banks], September 11, 14, 1915, (George M. Greene), [G. M. Greene]. MISSOURI: St. Louis, August 28, 1876, [Amer. Ent. Soc.].

Type: Missouri, [American Entomological Society.]

***Pseudomethoca (Nomiaephagus) oceola* (Blake), ♂.**

This seems to be a rare Lower Austral species. The Massachusetts records given by Melander probably apply to *sanbornii* or another species. It is probably the male of either *hippodamia* or *aetis*.

GEORGIA: Albany, September 1, 1910, 1 ♀, and Bainbridge, September 3 to 7, 1910, (the author), [Cornell Univ.]. FLORIDA: 1 ♂, [Amer. Ent. Soc.].

***Pseudomethoca (Nomiaephagus) hippodamia* (Fox), ♀.**

A rare Austroriparian species, probably the female of the preceding.

GEORGIA: Bainbridge, September 3 to 7, 1910, (the author), [Cornell Univ.]. ALABAMA: 1 ♀, [Amer. Ent. Soc.]. LOUISIANA: Shreveport, 1 ♀, [N. Banks.]; 3 ♀, [Amer. Ent. Soc.].

Pseudomethoca (Nomiaephagus) aetis (Fox), ♀.

An Austroriparian species of considerable rarity.

NORTH CAROLINA: Southern Pines, April 20, 1906, 1 ♀, (S. W. Foster), [Cornell Univ.]; same, April 22, 1913, 1 ♀, (A. H. Manee). GEORGIA: Okefenokee Swamp, June, 1912, 2 ♀, (Cornell Univ. Exped.), [Cornell Univ.]; Spring Creek, Decatur County, June 7 to 23, 1911, (the author), [Cornell Univ.]. FLORIDA: Enterprise, March 30, May 10, [Amer. Mus. Nat. Hist.]; Lakeland, March 28, 1912; Hanover, March 10, 1 ♀; and 4 ♀ without other than state record, [Amer. Ent. Soc.].

Pseudomethoca (Nomiaephagus) montivaga (Cresson), ♀.

Occasional in the Transition and Carolinian zones.

NEW YORK: Amagansett, Long Island, August 10, 1912, 1 ♀, [Brooklyn Museum]; Sea Cliff, Long Island, September, 1 ♀, (N. Banks), [N. Banks]. NEW JERSEY: Andrews, May 13, (the author), [Cornell Univ.]. VIRGINIA: Glencarlyn and Falls Church, 9 ♀, (N. Banks and G. M. Greene), [N. Banks, G. M. Greene, and Cornell Univ.]. GEORGIA: Austell, August 27, 1910, (the author), [Cornell Univ.].

Pseudomethoca (Nomiaephagus) sanbornii (Blake), ♂.

This is probably the male of *montivaga* or *simillima*.

MASSACHUSETTS: [Amer. Ent. Soc.]. NEW JERSEY: [Amer. Ent. Soc.]. DISTRICT OF COLUMBIA: [Amer. Ent. Soc.]. VIRGINIA: Falls Church and Chain Bridge, 6 ♂, (N. Banks), [N. Banks]. GEORGIA: Okefenokee Swamp, June, 1912, 1 ♂, (Cornell Univ. Exped.), [Cornell Univ.]. ALABAMA: 3 ♂, [Amer. Ent. Soc.].

Pseudomethoca (Nomiaephagus) simillima (Smith), ♀.

A rather common Carolinian and Austroriparian species, probably the female of the preceding.

MASSACHUSETTS: Chicopee, 1 ♀, [Cornell Univ.]. NEW YORK: Central Park, Long Island, July, 1 ♀, [Brooklyn Mus.]; Promised Land, Long Island, June 1, 1913, 1 ♀, (G. P. Engelhardt), [G. P. Engelhardt]; Wyandanch, Long Island, May, 1 ♀. NEW JERSEY: Andrews, May 13, (the author), [Cornell Univ.]; Lakehurst, 1 ♀, [Brooklyn Mus.]; Wenonah, June 6, 1915, 2 ♀, (G. M. Greene), [G. M. Greene]. DISTRICT OF COLUMBIA: Washington, September 6, 1 ♀, (N. Banks), [N. Banks]. VIRGINIA: Falls Church, Glencarlyn, Great Falls, April 28 to September 12, 50 ♀ (N. Banks), [N. Banks]. NORTH CAROLINA: Southern Pines, March 10, 1909, 1 ♀, (A. H. Manee). GEORGIA: Clayton, June, 1909, 1 ♀, and Rabun County, July 1910, 3 ♀, (W. T. Davis), [W. T. Davis]; Tallulah Falls, June 19 to 25, 1909, 1 ♀ (the author), [Cornell Univ.]; Austell, Aug. 27, 1910, 1 ♀, (the author), [Cornell Univ.]; Spring Creek, Decatur County, June 7 to 23, 1911, 1 ♀, (the author), [Cornell Univ.]. FLORIDA: 5 ♀, [Amer. Ent. Soc.]; Ormond, 1 ♀, (Mrs. A. T. Slosson), [Mrs. A. T. Slosson].

Pseudomethoca (Nomiaephagus) vanduzeei n. sp.

♂. Entirely coal-black, with short and sparse white pubescence, this brownish on the front, vertex, and dorsum; the second and all following dorsal segments with close, erect, and at the apex very dense, decumbent, flame-scarlet pubescence; wings deeply fuscous. Length, 14 mm.

Vertex sparsely, front rugosely, punctured, the latter obscured by vestiture; clypeus short, broad, polished, hairy, the anterior margin produced medially into a broad, short, bisinuate lobe, the sides of which are thickened; mandibles bidentate at apex, a carina from the inner tooth to the condyle; maxillary palpi compressed. Anterior surface of the scape concave, bicarinate; third segment subquadrate, shorter than the fourth.

Thorax anteriorly rounded, no line between the anterior and dorsal faces of the pronotum, the humeri entirely rounded; dorsum rather closely, somewhat irregularly punctate; mesopleura prominent, punctate; metapleura sunken, impunctate, polished; propodeum rather coarsely reticulate, with two elongate basal areas. The cell R_4 closed by a color line.

Abdomen slender, the first segment widened at apex and entirely sessile with the second, which widens comparatively little toward the apex; petiole without a noticeable ventral carina or tooth, sparsely, its disc not at all, punctate; second segment sparsely punctate; no pygidial area.

Type.—Clearwater, Florida, April 29, 1908, (E. P. VanDuzee), [American Museum of Natural History].

I take pleasure in dedicating this species to its collector, my good friend, Mr. E. P. VanDuzee. Its brilliant scarlet pubescence and shiny black ground color lend it a magnificence that is scarcely approached by any other North American mutillid, and readily distinguish it from any known species.

Despite its bidentate mandibles there can be no doubt, from its other characters, of this being a true *Nomiaephagus*, not distantly removed from such species as *aegeon* Fox.

Dasymutilla**Dasymutilla (Bruesia) harmonia** (Fox), ♀.

An always scarce species of the Carolinian and Austroriparian zones.

NEW JERSEY: Lakehurst, 1 ♀. PENNSYLVANIA. VIRGINIA: Falls Church and Great Falls, May 30 to September 12, 8 ♀, (N. Banks), [N. Banks]. NORTH CAROLINA: Hot Springs, 1 ♀, (Mrs. A. T. Slosson), [Mrs. A. T. Slosson]. GEORGIA: Okefenokee Swamp, June, 1912, 2 ♀, (Cornell Univ. Exp.), [Cornell Univ.]; Spring Creek, Decatur County, June 7 to 23, 1911, 1 ♀, (the author), [Cornell Univ.]. FLORIDA: Fort Myers, 1 ♀, and Punta Gorda, November 13, 1911, 1 ♀, (W. T. Davis), [W. T. Davis]; Atlantic Beach, 1 ♀, (Mrs. A. T. Slosson), [Mrs. A. T. Slosson]; Belleair, 1 ♀, (Mrs. A. T. Slosson), [Mrs. A. T. Slosson].

The male of this species is pretty certainly *bexar*. Mr. S. A. Rohwer⁷ has described the supposed male, basing his conclusion upon the fact that he had received a male and a female pinned together. I have examined these specimens, and while the female is a true *harmonia*, the male is a *castor*. The collector from whom Mr. Rohwer received his specimens, while a close and careful observer, is accustomed at times to pin females with males which he suspects of belonging to each other, even though he has not actually found them in copulation, as I have learned in connection with specimens received from him. In this connection it should be noted that the males of *castor* have tridentate mandibles unless they are too much worn to display the three teeth.

Dasymutilla (Bruesia) bexar (Blake), ♂.

Equivalent in distribution and scarcity to the preceding, of which it is doubtless the male.

VIRGINIA: Falls Church, September 14, 1915, 1 ♂, (G. M. Greene), [G. M. Greene]; Falls Church, July 21 and August 30, 4 ♂, Glencarlyn, July 26, 1 ♂, (N. Banks), [N. Banks]. GEORGIA: Billy's Island, Okfe诺基 Swamp, June, 1912, 2 ♂, (Cornell Univ. Exp.), [Cornell Univ.]. FLORIDA: Marco, 1 ♂, (W. T. Davis), [W. T. Davis].

Dasymutilla (Dasymutilla) occidentalis (Linnaeus).

This is a very common species of the Carolinian and Austro-riparian zones from Long Island to Florida and southwestward. The following is probably only a variety.

Dasymutilla (Dasymutilla) comanche (Blake).

This is probably a variety of the preceding, occurring with it in the extreme southern part of its range.

Dasymutilla (Dasymutilla) pyrrhus (Fox), ♂.

A rare species known only from central and more especially subtropical Florida.

FLORIDA: Tampa, May 2, 1908, 1 ♂, (E. P. VanDuzee), [Cornell Univ.]; Long Boat Key near Sarasota, August 14, 1910, 1 ♂, (the author), [Cornell Univ.]; La Belle, April 27, 1912, 1 ♂, (W. T. Davis); Gulfport, (Reynolds), [N. Banks]; Clearwater, May 1, 1908, 1 ♂, (E. P. VanDuzee) and Indian River, 1 ♂, [Amer. Mus. Nat. Hist.]; Enterprise, May 11, [Amer. Ent. Soc.].

Dasymutilla (Dasymutilla) gibbosa (Say), ♂.

MASSACHUSETTS: Springfield, 1 ♂, [Amer. Ent. Soc.]. CONNECTICUT. NEW YORK: Ithaca, July 27, 1886, 1 ♂, [Cornell Univ.]; Sea Cliff, Long Island,

⁷ Proc. U. S. Nat. Mus., 1912, 41: 455.

July 23, 1874, 1 ♂, (H. F. Bassett), [Amer. Ent. Soc.]. ILLINOIS: [Amer. Ent. Soc.].

This is not a common species. It seems to belong to the Transition region, extending slightly into the Carolinian. It is one of the few Mutillidae occurring around Ithaca, New York, and is absent from the very extensive collections made by Mr. Banks at Falls Church and elsewhere in Virginia. The same distribution holds for *cariniceps*, which also occurs at Ithaca and is apparently absent from Falls Church. This parallelism in distribution applying to these two species, and to no others closely related, leads me to suspect that they are the opposite sexes of one species.

Fox's record "Texas" is based on a misidentification. The specimen on which the record was based is in the collection of the American Entomological Society, and has its mandibles deeply notched externally. It does not belong to his group *occidentalis*. A single specimen from "Mexico" in the same collection appears to be a true *gibbosa*, and therefore Texas may eventually be included in the range of the species. A specimen referred to by Melander from "Pennsylvania" in the Museum of Comparative Zoology is certainly not this species, as my notes show that the clypeus is flat, not distinctly punctured, medially polished, its apex neither thickened nor emarginate. Until I can again see the specimen, I cannot state what it is.

***Dasymutilla (Dasymutilla) cariniceps* (Fox), ♀.**

1912. *Dasymutilla scrobinata* Rohwer, Proc. U. S. Nat. Mus., 41: 462, ♀.

MASSACHUSETTS: Great Barrington, July 24, 1910, 1 ♀, (G. P. Engelhardt), [G. P. Engelhardt]. CONNECTICUT: (type of *scrobinata*). NEW YORK: Ithaca, June 23, 1908, 1 ♀, August 7, 1889, 1 ♀, (N. Banks), [Cornell Univ.]; Ithaca, 2 ♀, (N. Banks), [N. Banks]; Sea Cliff, Long Island, 1 ♀, (N. Banks), [N. Banks]. PENNSYLVANIA: Delaware Water Gap, 1 ♀, (Mrs. A. T. Slosson). NEW JERSEY. ILLINOIS: (*scrobinata*).

As indicated above, this is probably the female of *gibbosa*. I have examined the type of *scrobinata* Rohwer, and find that it belongs to this species.

***Dasymutilla (Dasymutilla) anguliceps* (Fox), ♀.**

This species is still known only from the unique type from Illinois.

Dasymutilla (Dasymutilla) agenor (Fox), ♂.

Illinois: type in the collection of the American Entomological Society. Possibly the male of the preceding.

Dasymutilla (Dasymutilla) chattahoochei n. sp.

♀. Mahogany red; flagellum, tips of the segments of the legs, base and apex of the second dorsal segment, and all the following segments infuscated; head, dorsum, and second dorsal segment with sparse, erect and appressed, black pubescence, the latter also with appressed yellow pubescence; remaining segments and apex of the second covered with sparse silvery pubescence, interrupted medially on the second by dense black pubescence.

Head seen from above and in front with the sides convex, the widest part broadly interrupted by the prominent eyes, behind which the sides converge to the sharp but nevertheless obtuse hind angles; posterior border shallowly concave; the carinate hind angles removed from the eyes by one-half the long diameter of the latter (.58 mm.); front closely, vertex and genae sparsely, punctate. First segment of the flagellum longer than the second, but distinctly shorter than the two following united.

Width of head including the eyes, 1.9 mm., at the hind angles, 1.37 mm., of the thorax, 1.73 mm.; length of the dorsum, 2.45 mm., to the scutellar scale, 2.01 mm. Thorax with convex margins, slightly tapered posteriorly, humeral angles moderately sharp; caudal face of propodeum vertical only at apex, broadly rounded into the dorsal, its surface rasped.

Petiole short, widened posteriorly, its basal angles strongly dentate, seen from the side it is much elevated posteriorly, not constricted before the second segment, that segment very long and comparatively slender, 2.98 mm. long by 2.3 mm. wide at the widest point, which is well toward the apex, the petiole 1 mm. long; petiole with a thin, translucent, median, ventral keel, not toothed; pygidium strongly longitudinally striate, the edges not reflexed.

Type material.—Holotype: Bainbridge, Georgia, July 15 to 27, 1909, (the author), [Cornell University, No. 114.1]; two paratopotypes: June 2, 1911 and September 3 to 7, 1910, (the author), [Cornell Univ.]; six paratypes: Spring Creek, Decatur County, Georgia, June 7 to 23, 1911, (the author), and June 16 to 29, 1912, (Cornell University Expedition); one paratype: Southern Pines, North Carolina, June 14, 1911, (A. H. Mancee), [Cornell Univ.].

Dasymutilla (Dasymutilla) arenerronea n. sp.

♀. Color chestnut, the apical portion of the second dorsal segment orange-rufous; pubescence inconspicuous and sparse; the second dorsal segment with decumbent black hairs, over the orange spot with yellow hairs; the apical segment rather densely covered with yellowish pubescence. Length, 6 mm.

Head transverse, strongly narrowed behind the eyes, convex in front and strongly concave behind, the lateral angles sharp, rectangular, subcarinate;

eyes prominently gibbous, intersecting near their bases the outline of the head as seen from above or in front; vertex sparsely, forehead more closely but not coarsely, punctate; no carinae between the eyes and the antennae. Third antennal segment shorter than the fourth and fifth united.

Thorax slender, narrowed posteriorly, slightly contracted at the spiracles, the humeral angles not sharp; caudal face of the propodeum vertical, rounded above and laterally into the thorax.

Petiole with a thin carina beneath; second segment long and tapered at base; pygidium striate.

Type material.—Holotype: St. Petersburg, Florida, August 12, 1910, (the author), [Cornell Univ. No. 115.1]; paratype: Cedar Keys, Florida, June 4, [American Entomological Society].

***Dasymutilla (Dasymutilla) rubicunda* n. sp.**

♀. Claret brown, the legs and antennae black; a transverse band of black pubescence at the tip of the dorsum; petiole, second, third, fourth, and fifth segments with an apical band of silvery pubescence, interrupted medially on the second dorsal; this segment with a medial covering of appressed black hairs, replaced by white at the sides; elsewhere the pubescence is sparse and inconspicuous.

Seen from above the sides of the head are straight, parallel, broadly interrupted by the very prominent bead-like eyes, behind which they do not converge, but meet the somewhat concaved posterior border at an acute angle; these angles sub-alate, removed from the eyes by one-half (.11 mm.) the longer diameter of the latter (.21 mm.); head on the front and vertex strongly closely punctate, beneath the eyes sparsely but coarsely punctate; front without carinae between the antennae and the eyes. Scape coarsely punctate; first segment of the flagellum long, slightly exceeding the following two taken together.

Width of the head including the eyes, 2.45 mm., at the hind angles 2.04 mm., of the thorax, 2.59 mm. (this just behind the tegulae). Length of the dorsum, 3.6 mm., to the scutellar scale 2.88 mm.; the sides convex, slightly narrowed behind, the humeral angles fairly sharp; caudal surface vertical but broadly rounded into the dorsal.

Petiole as seen from above widened posteriorly, from the side strongly elevated posteriorly, not much constricted before the second, greatly smaller than the base of the same, its ventral carina weak with a rounded anterior lobe; second dorsal closely punctate; pygidium evenly and strongly longitudinally striate, its margins reflexed.

Type.—Gulfport, Florida, June. (Reynolds). Collection of Nathan Banks.

***Dasymutilla (Dasymutilla) rugulosa* (Fox), ♀.**

? 1903. *Mutilla infensa* Melander and Brues, Biol. Bull., p. 24, ♀.

So far as collections or my experience show this is a rare species of restricted distribution within the northern limits of the Caro-

linian zone. Fox states that it is not uncommon in southern New Jersey. Venturing a guess, from distribution and elimination, it may be the male of *canella*. Melander definitely unites it with *canella* but without stating his reasons.

MASSACHUSETTS: Woods Hole. NEW YORK: Sea Cliff, Long Island, July, 3 ♀, (N. Banks), [N. Banks]. NEW JERSEY: Westville, August 30, 1 ♀, (the author), [Cornell Univ.]; Clifton, August 11, 1912, 1 ♀, (G. M. Greene), [G. M. Greene].

***Dasymutilla (Dasymutilla) canella* (Blake), ♂.**

PENNSYLVANIA: Philadelphia, July, 1912, 2 ♂, (Carl Ilg), [Cornell Univ.]. New Jersey: Westville, June 13, 1901, (H. L. Viereck), [Amer. Ent. Soc.]; Gloucester County, 1 ♂, [Amer. Ent. Soc.]. TEXAS: 1 ♂. NEBRASKA: 1 ♂.

***Dasymutilla (Dasymutilla) cypris* (Blake), ♀.**

1871. *Mutilla (Sphaerophthalma) mutata* Blake, Trans. Amer. Ent. Soc., 3: 247, ♀.

1912. *Dasymutilla mutata miamensis* Rohwer, Proc. U. S. Nat. Mus., 41: 462, ♀.

1912. *Dasymutilla allardi* Rohwer, Proc. U. S. Nat. Mus., 41: 463, ♀.

This is one of the most common eastern species in the Carolinian and Austroriparian zones from Massachusetts to Florida. It is known to extend westward to Colorado. It varies greatly in both color and size. Some specimens from southern Georgia and Florida are of a rufo-piceous color, with or without indistinct pale spots on the second dorsal segment, and with very dark or almost black legs. To these Mr. S. A. Rohwer has given the varietal name *miamensis*.

The presence of four orange spots on the second dorsal segment is a prevailing characteristic of this species, but they sometimes are reduced to two, or altogether wanting.

Dasymutilla allardi Rohwer, of which I have examined the type, can hardly be looked upon as other than an individual variation of this common and variable species. It differs from the usual form in having the hook on the under side of the petiole slightly notched at tip, although confined to the anterior part of the segment and otherwise as in typical *cypris*.

***Dasymutilla (Dasymutilla) castor* (Blake), ♂.**

1912. *Pyenomutilla harmonia* Rohwer, Proc. U. S. Nat. Mus., 41: 455, ♂.

This is the most common species known in the male sex in the eastern United States, inhabiting the Carolinian and Austrori-

parian zones from Massachusetts to southern Florida. Westward it is known to Illinois, Oklahoma and Texas. I suspect that there are two or even three closely allied species included under the name *castor*, and hope to determine this point at a later date. *Castor* is most probably the male of *cypris* and may also include the male of *sappho*.

***Dasymutilla (Dasymutilla) ferrugata* (Fabricius), ♀.**

1910. *Mutilla vierecki* Rohwer, Proc. Ent. Soc. Wash., 12: 49, ♀.

1912. *Dasymutilla ferrugata* var. *ballabetei* Rohwer, Proc. U. S. Nat. Mus., 41: 456, ♀.

1912. *Dasymutilla georgiana* Rohwer, Proc. U. S. Nat. Mus., 41: 456, ♀.

1912. *Dasymutilla plesia* Rohwer, Proc. U. S. Nat. Mus., 41: 456, ♀.

A common species of the Carolinian and Austroriparian zones from Massachusetts to southern Florida, westward to Nebraska and Arizona.

I have examined a large series from the eastern coastal states from Long Island to Florida, and find a surprising amount of variation in size, color, and structure. No line can be drawn between these, although the extremes are very different. Some individuals from Florida are so large and densely pubescent as to suggest *occidentalis* in appearance, and in these the eyes are less strongly gibbous, and the width of the thorax is from .17 to .30 in excess of the extreme width of the head, including the eyes. There is a more or less gradual increase in the prominence of the eyes, until the extreme represented by *georgiana* Rohwer is reached. There is great but gradual reduction in general size, and the reduction is not paralleled with an equal reduction in the size of the head, so that we find the smaller individuals with the thorax no wider than the head, eyes included, and this proportion ranging to an excess of .3, as shown in the following measurements of 33 specimens, given in millimeters.

Width of head including eyes.	Width of thorax.	Approx. excess of latter.	Width of head including eyes.	Width of thorax.	Approx. excess of latter.
3.24	4.18	.3	2.23	2.45	.09
3.00	4.	.3	2.23	2.45	.09
3.00	4.	.3	2.30	2.52	.09
3.00	3.96	.29	2.27	2.37	.05
2.95	3.75	.27	1.87	1.94	.04
3.02	3.6	.19	2.08	2.08	.0

Width of head including eyes.	Width of thorax.	Approx. excess of latter.	Width of head including eyes.	Width of thorax.	Approx. excess of latter.
2.67	3.16	.19	2.08	2.08	.0
2.81	3.31	.18	2.01	2.01	.0
2.74	3.24	.18	2.05	2.01	-.02
2.70	3.24	.18	1.91	1.87	-.02
2.37	2.81	.18	2.01	1.94	-.03
2.50	2.88	.18	1.94	1.87	-.03
2.74	3.16	.16	1.87	1.80	-.04
2.67	3.09	.16	1.87	1.80	-.04
2.37	2.74	.15	1.87	1.80	-.04
2.81	3.16	.13	1.94	1.84	-.05
2.30	2.60	.13			

The male of this species is probably *lepeletierii*. Southern specimens often have the legs red, or partially so, and such have been designated by Mr. S. A. Rohwer variety *balabetei*. I have examined the types of *vierecki*, *georgiana* and *plesia*.

Dasymutilla (Dasymutilla) lepeletierii (Fox), ♂.

1912. *Pycnomutilla harmoniiformis* Rohwer, Proc. U. S. Nat. Mus., 41: 455, ♂.

This is probably the male of *ferrugata* and is definitely united with it by Mr. Melander, who does not state his reasons.

NEW YORK: Yaphank, Long Island, July 4, 1 ♂; Wading River, Long Island, 1 ♂, [Brooklyn Museum]. NEW JERSEY: Lakehurst, [Brooklyn Museum]; Ocean County, 3 ♂, [Amer. Ent. Soc.]; Jamesburg, July 2, 2 ♂, (Mrs. A. T. Slosson), [Mrs. A. T. Slosson]. PENNSYLVANIA. MARYLAND: Bay Ridge, 1 ♂, (N. Banks), [N. Banks]. NORTH CAROLINA: Nance, June 16, 1906, (S. W. Foster), [Cornell Univ.]. GEORGIA: Billy's Island, Okefenokee Swamp, June, July, 1912, 3 ♂, (Cornell Univ. Exped.), [Cornell Univ.]; Bainbridge, July 15 to 27, 1909 (the author), [Cornell Univ.]; Spring Creek, Decatur County, July 16 to 29, 1912, 4 ♂, (Cornell Univ. Exped.), [Cornell Univ.]. FLORIDA: Apalachicola, July 21 to 23, 1909, 2 ♂, (the author), [Cornell Univ.]; Lanark, July 20, 1909, 1 ♂, (the author), [Cornell Univ.].

It is an interesting fact that neither *ferrugata* nor *lepeletierii* are represented in the extensive collection of Mutillidae made by Mr. Nathan Banks at East Falls Church, Virginia, although each are represented by a single specimen caught in neighboring localities.

Dasymutilla (Dasymutilla) vesta Cresson, race **zella** Rohwer, ♀.

1910. *Mutilla zella* Rohwer, Proc. Ent. Soc. Wash., 12: 50, ♀.

1912. *Dasymutilla ferrugatella* Rohwer, Proc. U. S. Nat. Mus., 41: 458, ♀.

1912. *Dasymutilla coloradella virginica* Rohwer, Proc. U. S. Nat. Mus., 41: 459, ♀.
1912. *Dasymutilla segregata segregata* Rohwer, Proc. U. S. Nat. Mus., 41: 459, ♀.
1912. *Dasymutilla segregata finni* Rohwer, Proc. U. S. Nat. Mus., 41: 459, ♀.
1912. *Dasymutilla champlaini* Rohwer, Proc. U. S. Nat. Mus., 41: 461, ♀.
1912. *Dasymutilla carolina* Rohwer, Proc. U. S. Nat. Mus., 41: 462, ♀.

The eastern specimens of *vesta* differ from the western ones by being much less pubescent and lacking the upright sparse white hairs. As this difference is apparently a constant geographical one, it may be recognized as an eastern race, under the name *zella* bestowed upon it by Mr. Rohwer.

The species is very variable in the form of its petiolar carina. Typically this is bidentate, but the posterior tooth may be reduced or wanting, thus approaching the condition found in *ferrugata*. There is, however, in *vesta* almost always a remnant of the carina on the posterior part of the petiole, wanting in *ferrugata*, and the anterior tooth while of a somewhat variable shape, is not a definitely shaped, acute, recurved tooth as in *ferrugata*.

I have examined the types of the seven species and varieties listed above, and find them all variations of *vesta*. *Carolina* is based on a single specimen with abbreviated striation of the pygidium, but I can only look upon it as abnormal in this respect.

The species is rather common in the Carolinian and Austro-riparian zones from Massachusetts and eastern New York to Georgia. In South Georgia and Florida it is largely, if not entirely, replaced by the very closely allied *sappho*, which may indeed be only a race.

As suggested by Fox, *vesta* is probably the female of *macra*. Both, especially the male, were represented in greater numbers than I would have expected in the collections made by Mr. Banks in eastern Virginia.

Mutilla (Dasymutilla) macra (Cresson), ♂.

NEW YORK: Amagansett, Long Island, August 10, 1912, 1 ♂, [Brooklyn Museum]; Sea Cliff, July, 1 ♂, (N. Banks), [N. Banks]. NEW JERSEY: MARYLAND: Great Falls, July 13, 1 ♂, (N. Banks), [N. Banks]. VIRGINIA: Glencarlyn and Falls Church, July 12, to September 14, 22 ♂, (N. Banks and G. M. Greene), [collections of same.]. NORTH CAROLINA: Southern Pines,

August 9, 1911, 1 ♂, (A. H. Manee), [Cornell Univ.]. GEORGIA: Toccoa, August 15, 1 ♂, (the author), [Cornell Univ.]; Atlanta, July 6, 1909, 1 ♂, (the author), [Cornell Univ.]; Spring Creek, Decatur County, July 16 to 29, 1912, 1 ♂, (Cornell Univ. Exped.), [Cornell Univ.]. ILLINOIS: Algonquin, 4 ♂, [Amer. Ent. Soc.].

***Dasymutilla (Dasymutilla) sappho* (Fox), ♀.**

This species is a close ally, if not indeed a race, of *vesta*, replacing it in southern Georgia and Florida. The male is unknown, but may be involved in *castor*.

GEORGIA: Unadilla, June 25, 1910, 1 ♀, (the author), [Cornell Univ.]; St. Simon's Island, April 22 to May 12, June 3, 3 ♀, (the author), [Cornell Univ.]; Cumberland Island, April 29, 2 ♀, (the author), [Cornell Univ.]; Bainbridge, June, 1911, and Spring Creek, Decatur County, 7 ♀, (the author), [Cornell Univ.]. FLORIDA: Marco, April 18, 1912, 2 ♀, (W. T. Davis); Ft. Myers, March 31, 1912, 2 ♀, (W. T. Davis); Lakeland, August 16, 1910, 1 ♀, (the author), [Cornell Univ.]; Lakeland, 1 ♀, and Marco, 1 ♀, (W. T. Davis), [W. T. Davis]; Punta Gorda, November 14, 1911; Sanford, April 30, 1908, 1 ♀, (E. P. Van Duzee), [Amer. Mus. Nat. Hist.]; Indian River, 2 ♀, [Amer. Mus. Nat. Hist.]; Capron and Lake Worth, [Amer. Ent. Soc.]; Biscayne Bay, Lake Worth, 5 ♀, (Mrs. A. T. Slosson), [Mrs. A. T. Slosson]. LOUISIANA: New Orleans, August 6, 1915, 1 ♀, (Rehn and Hebard), [G. M. Greene].

***Dasymutilla (Dasymutilla) obscura* (Blake), ♂, ♀.**

1871. *Mutilla* (*Sphaerophthalma*) *scacvola* Blake, Trans. Amer. Ent. Soc. 3:247, ♀.

I associate *scaevola* with *obscura* on the authority of Mr. Melander, who states that the Rev. Mr. Birkmann has been able to definitely associate them as sexes of one form. Eastern specimens of the female differ from the western ones in the absence of the sparse upright white and reddish pubescence, and by having darker colored legs. The female recorded by Mr. Melander from Massachusetts, in the Museum of Comparative Zoology, proves to be a specimen of *cypria*.

So far as the eastern states are concerned the species is confined, so far as known, to the Carolinian Zone, from Long Island to the mountains of northern Georgia, and is scarce.

Males. VIRGINIA: Falls Church and Great Falls, July 6 to August 2, 16 ♂, (N. Banks), [N. Banks]. NORTH CAROLINA: 1 ♂, [Amer. Ent. Soc.]. KENTUCKY: 1 ♂, [Amer. Ent. Soc.]. GEORGIA: Tallulah Falls, Rabun County, June 19 to 25, 1909, 2 ♂, (the author), [Cornell Univ.].

Females. NEW YORK: Greenport, Long Island, August 3, 1915, 1 ♀, (G. P. Engelhardt), [G. P. Engelhardt]; Wading River, Long Island, 1 ♀, [Brooklyn Museum]. VIRGINIA: Falls Church, Great Falls and Glencarlyn, July 8 to September 11, 11 ♀, (N. Banks & G. M. Greene), [collections of the same].

GEORGIA: Clayton, Rabun County, July, 1910, 3 ♀, (W. T. Davis), and Rabun County, June, 1909, 1 ♀, (W. T. Davis), [W. T. Davis and Cornell Univ.].

Dasymutilla (**Dasymutilla**) **chlamydata** (Melander), ♀.

1903. *Mutilla chlamydata* Melander, Trans. Amer. Ent. Soc., 29: 299, ♀.

This species, described from Illinois, is unknown to me.

Sphaerophthalma Blake

Sphaerophthalma (**Sphaerophthalma**) **pennsylvanica** Lepelletier, ♂, ♀.

1871. *Mutilla* (*Sphaerophthalma*) *scabra* Blake, Trans. Amer. Ent. Soc., 3: 232, ♂.

1871. *Mutilla* (*Sphaerophthalma*) *balteola* Blake, Trans. Amer. Ent. Soc., 3: 248, ♀.

I see no reason for treating *scabra* as other than a northern black form of *pennsylvanica*, which occurs in the extreme south, and like so many southern Hymenoptera, has its black colors largely replaced by red. *Balteola* is unquestionably the female, and in that sex there is no noticeable difference between the northern and southern forms.

Males. Race *pennsylvanica*. NORTH CAROLINA: 1 ♂, [Amer. Ent. Soc.]. GEORGIA: Rabun County, July, 1910, 1 ♂, (W. T. Davis), [W. T. Davis]; Spring Creek, Decatur County, July 16 to 29, 1912, and Billy's Island, Okefenokee Swamp, June, 1912, 3 ♂, (Cornell Univ. Exp.), [Cornell Univ.]. FLORIDA: Crescent City, April 23, 1908, 1 ♂, (E. P. VanDuzee), [Amer. Mus. Nat. Hist.]; 2 ♂, [Amer. Ent. Soc.]. TEXAS:

Males. Race *scabra*. PENNSYLVANIA: Rockville, July 5, 1915, 1 ♂, (G. M. Greene), [G. M. Greene]; 2 ♂ [Amer. Ent. Soc.]. VIRGINIA: Falls Church, Great Falls, Glencaryn, June 27 to September 7, 30 ♂, (N. Banks), [N. Banks and Cornell Univ.].

Females. PENNSYLVANIA: Philadelphia, June 18, 1 ♀, [Amer. Ent. Soc.]. VIRGINIA: Falls Church, 5 ♀, (N. Banks), [N. Banks]; Great Falls, June 27, 1915, 1 ♀, (G. M. Greene), [G. M. Greene]. GEORGIA: Rabun County, July, 1910, 2 ♀, (W. T. Davis), [W. T. Davis and Cornell Univ.]; Spring Creek, Decatur County, June 7 to 23, 1911, 1 ♀, (the author), [Cornell Univ.]; Billy's Island, Okefenokee Swamp, June, 1912, 1 ♀, (Cornell Univ. Exp.) [Cornell Univ.]. TEXAS:

Sphaerophthalma (**Photomorphus**) **banksi** n. sp.

♂. Coal-black, with erect white pubescence, mixed with shorter decumbent, brown pubescence on the mesonotum and second dorsal segment; wings slightly clouded, more so beyond the venation. Length, 7.5 to 11.5 mm.

Head very large, as seen from above quadrate, the corners rounded, widest behind the eyes, where it is as wide as the thorax with the tegulae included; eyes small, very remote from the hind margin of the head, the temples being far broader than the eyes; head coarsely and closely punctured, rugose on the

front; ocelli minute, the posterior pair .08 mm. in diameter, .78 mm. or nine times as far from the eyes; face and clypeus with a raised, polished, and impunctate triangle with its apex between the antennae; the depressed sides of the face polished and impunctate; margins of the clypeus with a slight emargination; mandibles exceedingly robust and awry, a large tooth on the lower margin near the base. Scape hirsute, with a longitudinal keel; third segment longer than the pedicel, two-thirds as long as the fourth.

Pronotum, mesonotum, and scutellum coarsely, closely punctate, side pieces of pronotum with a sharp anterior carina; anterior portion of mesosternum on each side of the median line with a large rounded swelling, not carinate; just in front of the middle coxae is a high triserrate peg-like process on each side of the mesosternum; propodeum coarsely reticulate, with a poorly defined double basal area.

Petiole rather long and very strongly gibbous, constricted from the second, the posterior part being almost at right angles to the dorsal surface, weakly and sparsely punctured; second dorsal segment with sparse small punctures, its apex and that of the remaining segments closely punctulate and bearing numerous long white hairs; pygidium closely punctulate; the venter unarmed, its last segment broad, slightly concave and closely evenly punctate.

Type material.—Holotype: Falls Church, Virginia, July 21, (N. Banks), [Cornell Univ. No. 107.1]; six paratopotypes: June 14, July 4, 6, 28, August 30, one paratype from Great Falls, Virginia, July 7, (N. Banks), [paratypes in the collections of N. Banks, Amer. Ent. Soc. and Cornell Univ.]. One paratype taken on *Ceanothus*.

The very long head of this species and the peg-like processes on the mesosternum abundantly distinguish it from all known species. The only other described totally black species is *quintilis* Viereck.

Sphaerophthalma (Photomorphus) aloga (Viereck), ♂.

1903. *Photomorphus alogus* Viereck, Ent. News, 14: 251, ♂.

GEORGIA: Tifton, 1 ♂, [Amer. Ent. Soc.].

Sphaerophthalma (Photomorphus) johnsoni (Viereck), ♂.

1903. *Photomorphus johnsoni* Viereck, Ent. News, 14: 249, ♂.

NEW JERSEY: Riverton, [Amer. Ent. Soc.]. VIRGINIA: Falls Church, July 4, 10, 2 ♀, (N. Banks), [N. Banks]. NORTH CAROLINA: Southern Pines, May 23, 1911, 1 ♂, (A. H. Manco).

Sphaerophthalma (Photomorphus) rubroscutellata n. sp.

♂. Black, the head above the eyes stained reddish, the scutellum, post-scutellum, and apex of the propodeum reddish yellow; clothed with sparse, erect, white hairs, more abundant and longer on the apical part of the abdomen,

brown on the front, vertex, mesonotum, and second and sixth dorsal segments; wings hyaline, slightly infuscated apically, darkest below the stigma; stigma and veins piceous. Length, 5.5 mm.

Head sparsely punctate, somewhat rugosely above the antennae; clypeus flat, impunctate, the anterior margin slightly produced mesally, subtruncate; mandibles deeply notched and with a large tooth beneath.

Pronotum closely, shallowly, mesonotum more sparsely, scutellum rugosely, punctate; propodeum shallowly reticulate, with two small ill-defined basal areas.

Petiole nodose obsoletely sparsely punctulate; second dorsal very sparsely punctulate.

Type.—Falls Church, Virginia, July 10, (N. Banks), [N. Banks].

Photopsis Blake

Photopsis myrmicoides (Cockerell), ♀.

VIRGINIA: Falls Church, July 4 to September 1, 11 ♀, (N. Banks), [N. Banks and Cornell Univ.]. NORTH CAROLINA: Southern Pines, June 15, 1911, 1 ♀, (A. H. Mance), [N. Banks.]. GEORGIA: Clayton, July 10, 2000 to 3700 ft. elev., 1 ♀, (W. T. Davis), [W. T. Davis].

(Odontophotopsis)

Photopsis (Odontophotopsis) paula n. sp.

♂. Entirely rufo-ferruginous, except the legs and antennae are brown; clothed with considerable, erect, white pubescence; wings crossed by a fuscous band.

Head about as wide as the thorax, rather extended behind the eyes and ocelli; the latter very large, the posterior pair behind the supraorbital line, removed from the compound eyes by about twice and from each other by one and a half times their diameter, and from the front pair by less than their diameter; head covered with sparse, erect, rather long, white pubescence, the face below the antennae being glabrous; front with rather close, irregular, setigerous punctures, becoming well separated, round, and smaller above and on the occiput, the intervals polished, shining; on the front above and between the bases of the antennae and each eye is a small mammilliform process; occiput convex; posterior and postero-lateral angles of the head not defined, unarmed; antennae separated by distinctly less than the diameter of the ocelli, with only a poorly defined earina between and below them; face below the eyes much depressed; clypeus entirely glabrous, impunctate and polished, its anterior margin produced medially, this portion somewhat reflexed, slightly emarginate, and with its lateral angles dentate, but not pronouncedly so; the pubescent labrum largely concealed; the malar space punctured, not one-third as long as wide; mandibles gross, strongly curved, with two large blunt teeth at the apex, the inferior margin strongly notched, the superior margin formed by a strong sinuate earina bordering the scrobe, the latter slightly convex, closely punctured, hirsute. Scape short, a little longer than the first two segments of the flagellum, much curved, roughly punctulate and hirsute,

with an obscure inferior carina; pedicel about as long as broad, about two-thirds the length of the first segment of the flagellum, which is about two-thirds the length of the second; the latter a little exceeding the third; pedicel and flagellum puberulent.

Humeral angles absent; pronotum without differentiated dorsal and cephalic surfaces, more coarsely punctured than the front, the punctures not confluent; mesonotum similarly punctured, scutellum more closely; mesopleura, except for a small anterior area, with coarse round punctures; mesosternum anteriorly on each side with an oblique elevated ridge or mamilla, behind which it is concave; mesopleura without coarse punctures, except a few near the coxae, feebly polished, with sparse very minute punctulations, bearing short hairs; propodeum posteriorly with coarse shallow reticulations, and with a median, basal, smooth area, bounded laterally and traversed medially by carinae; punctate portions of the thorax, except the mesonotum, with sparse, erect, white hairs, longest on the propodeum and pronotum; mesonotum covered with shorter, suberect, sparse, reddish mixed with black hairs; most parts of the thorax with short, white, inconspicuous pubescence, giving in fortunate lights a silvery sheen.

Forewings hyaline at base, a weakly fuscous band crossing them at the region of the stigma, becoming almost hyaline again at the apex; the cell R_4 (third submarginal) not enclosed; hind wings clouded toward the apex.

Legs, except the coxae and trochanters posteriorly, dark brown; the coxae, trochanters and femora covered with erect, sparse, white hairs; the tibiae and tarsi with denser, less erect, white pubescence; longer calcarium of the posterior tibiae about two-thirds the length of the metatarsus, white.

First segment of the abdomen, seen from above, rather long, much widened apically, distinctly smaller at its apex than the basal part of the second segment, the two with an evident constriction between; as seen from the side the former is very convex, distinctly nodose above, and strongly constricted at apex, especially so dorsally; dorsally it bears a couple of short carinae at the base, and for the most part is sparsely and very shallowly punctate; ventrally it is roughly and rather coarsely punctured, the carina distinct only anteriorly, where it is rectangularly truncate; the second dorsal segment is polished and shining, with sparse, very shallow, small, setigerous punctures, along the apex with close very minute punctulations; exposed portions of the remaining dorsal segments except the last with close very minute punctulations; exposed portion of the last dorsal segment with a triangular area on each side at base coarsely punctured, and bearing erect bristles, remainder smooth and polished, except for fine punctulations at the apex; second ventral segment with sparse shallow punctures, except at apex, among these more or less minute punctulations; apex of this and exposed parts of remaining ventral segments except the last with minute punctulations; last ventral segment polished and shining, with sparse round punctures, and without processes; petiole and base of second segment with sparse, erect, white hairs, rest of second segment with shorter, suberect, whitish hairs; remaining segments with bristly, white, and some black hairs.

Length of the type, 10 mm.; of forewing, 6.5 mm.; length of paratype, 7 mm. The abdomen is distinctly longer than the head and thorax united.

Type material.—Holotype: Spring Creek, Decatur County, Georgia, July 16 to 29, 1912. (Cornell Univ. Exped.), [Cornell Univ. No. 108.1.]; one paratopotype: same date.

Photopsis (*Odontophotopsis*) *spinci* n. sp.

♂. Entirely rufo-ferruginous, except the legs, antennae, mandibles, and mouth parts, which are brown; clothed with considerable erect white pubescence; wings slightly infuscated.

Head not as wide as the thorax, rather extended behind the eyes and ocelli; the latter large, the posterior pair behind the supraorbital line, removed from the compound eyes by more than three times and from each other by less than two times their diameters, and from the front pair by a little less than their diameter's length; head covered with sparse, erect, rather long, white pubescence, with a few black hairs behind the compound eyes; with sparse, rather large and deep, setigerous punctures, smaller and sparser behind the eyes, the intervals polished; occiput convex; posterior and postero-lateral angles of the head not defined, unarmed; antennae separated by less than the diameter of the ocelli, with a sharp carina between and below them; clypeus laterally very minutely punctulate, with a median, smooth, polished and impunctate area; medially the clypeus is produced, with a somewhat reflexed anterior margin; malar space about one-third as long as broad, with close punctures; mandibles gross, elbowed, with a deep incision on their lower margin, and their anterior surface with a very strong carina bounding the scrobe and extending the entire length of the mandibles; scrobe flat, rugosely punctate and hirsute. Scape short, scarcely as long as the first two segments of the flagellum, much bent out apically, roughly punctulate and hirsute, with an infero-anterior obscure carina; pedicel scarcely as long as broad, about two-thirds the length of the first segment of the flagellum, the latter about two-thirds the length of the second, which is about equal to the third; pedicel and flagellum puberulent.

Humeral angles absent; pronotum without differentiated cephalic and dorsal surfaces, a little more closely punctured than the front; mesonotum with sparser larger punctures; scutellum punctured like the pronotum; mesopleura impunctate except medially; mesosternum on each side with a short, blunt, somewhat oblique, nipple-like tubercle; metapleura impunctate; propodeum posteriorly shallowly reticulate, with a smooth, basal, median area, bounded laterally and traversed medially by carinae; punctate portions of the thorax bearing sparse, erect, white pubescence, longest on the propodeum and pronotum, mingled with a few black hairs on the posterior part of the mesonotum; pleura in places, especially beneath the forewings, with a short silvery pubescence, giving a sheen in certain lights.

Fore wings nearly hyaline basally, a poorly defined fuscous cloud traversing them in the region of the stigma becomes obsolete at the apex; the cell R_4 (third submarginal) not enclosed. Hind wings also with a transverse cloud in the stigmatal region.

Legs except the coxae and trochanters dark brown; the coxae, trochanters, and femora covered with erect, very sparse, white hairs, the tibiae and tarsi

with denser, almost silky, sub-erect or almost depressed, white hairs; calcaria of the hind legs white, more than three-fourths as long as the metatarsus.

First segment of the abdomen, seen from above, rather long, much widened apically, not much smaller at apex than the base of the second, from which it is separated by only a slight lateral constriction; from a lateral view, it is distinctly convex above, not strongly nodose, but separated from the base of the second by well marked dorsal and ventral constrictions; dorsally it is roughly punctured at base, the apical two-thirds smooth and polished, beset only with minute, sparse, setigerous punctures; ventrally it is coarsely punctured, the carina in the form of a ridge, without dentiform prolongations, but anteriorly somewhat acutely truncate; the second dorsal segment is polished and shining, with sparse, minute, setigerous punctures, thickly set along the apical margin; the second ventral segment is beset with sparse but large punctures, about corresponding to those on the front, more minute and closer set along the apical margins; a ridge of white pile is present along the lateral margin of the second dorsal segment, and a shorter one along the second ventral; remaining dorsal and ventral segments except the last with close-set minute punctures, therefore somewhat opaque; last dorsal segment impunctate and polished, especially medially, last ventral flattened, truncate at apex, with processes, sparsely punctured, polished; two apical spines long; abdomen beset with sparse, erect, white hairs, often bristly, among which are a few black ones on the apical segments, ventral surface also with subappressed, sparse, white hairs; erect hairs of the second dorsal, except at apex, shorter than elsewhere.

Length, 7.5 mm.; forewing, 6 mm. Abdomen about equalling the combined length of the head and thorax.

Type material.—Holotype: Bainbridge, Decatur County, Georgia, July 15 to 27, 1909, (the author), [Cornell Univ. No. 109.1.]; two paratypes received from Mr. Banks, Southern Pines, North Carolina, October 27, 1908, July 26, 1910 (A. H. Mance) [N. Banks and Cornell Univ.]; one paratype: "Ga.", [Amer. Ent. Soc., included by Viereck among the type material of *subtenuis*].

This species is a very close ally of *subtenuis* Viereck, but in that species the mesosternal processes are crenulate behind, the notch on the mandibles is shallower, the subtending tooth smaller, and the clypeus is narrower at apex.